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TORPEDO BOATS IN NAVAL WARFARE.

BY BENJ. MICOU, FORMER CHIEF CLERK OF THE NAVY DEPARTMENT.

THE fifty-third Congress authorized six torpedo boats, some of which are now completed, and since then thirteen more have been authorized and contracts for them awarded. This means that a new element of strength, and one of great value, is to be added to our navy. Torpedo vessels furnish the most destructive means of attack known, cost less and can be constructed more quickly than any other modern warships, yet we are in the number possessed at the bottom of the list of naval powers, and will still be when we have completed our present building programme.

We have now but five torpedo boats, the "Cushing," with a speed of 22.48 knots, the "Ericsson" and "Foote" with a speed of some 24 knots, and the "Porter" and "Dupont" which are 26-knot boats. So, when the ones now building go into commission we shall have 21; quite an increase over five, but still very few in comparison with other countries. Taking last year's figures, England has 256, France 244, Russia 185, Germany 155, and Spain 46. Of England's 256, 42 are of the class known as torpedo-boat destroyers, or vessels which, in addition to being equipped for attacking with torpedoes, are specially designed to destroy other torpedo boats. The trial speeds of these 42 boats vary from 26 to 28 knots. England also has 28 torpedo vessels building, designed to attain a speed of 30 knots, and has just let contracts for several others designed to attain a speed of 32 knots.

A torpedo boat is said to have been launched in New York harbor in 1776, but if this be true the history of the craft did not survive the launching, for it does not appear to have ever

been heard from again. A drifting torpedo directed against a frigate, but which missed its aim, is reported to have destroyed a schooner at New London, in 1777, and we know that in 1807 Robert Fulton invented a torpedo and experimented with it, though these experiments led to no immediate practical results.

It was not until our Civil War that the world received its first lesson in this novel and destructive method of fighting. We did not, however, follow up and develop the new mode of warfare we had introduced, for after 1865 the navy stood still for nearly seventeen years. Our people seemed tired of all that related to war and nothing modern was undertaken. In 1882 we did not have a modern vessel, and thirteen single-turreted monitors built in 1862 and 1863, armed with old-fashioned, muzzle-loading, smooth-bore guns, and thirty-seven unprotected wooden cruisers, composed our entire fighting force.

It was in 1883 that we commenced a modern navy. Vessels requiring most time for construction received the first consideration, and those which, no matter how destructive, could be built in a year had to wait until cruisers and battleships were secured. Thus it is that Europe has outstripped us in all that relates to torpedoes.

The torpedo boat is merely an agent for rendering more effective the torpedo, and need of it was felt long before the idea was conceived of designing a boat for this special purpose.

The mobile torpedo, when first invented, was used on a spar attached to a large vessel, but this offered no possibility of attacking an enemy unawares. The attack must always be open, and it was soon discovered that an open attack greatly circumscribed the possibilities of the torpedo. To overcome this difficulty, and increase the scope of torpedo operations, smaller boats were used to which to attach spars, and the steam cutters carried by our larger vessels, being the only small boats available, were pressed into service. It was from such a cutter that Cushing exploded the torpedo which destroyed the Confederate ram "Albemarle" in Roanoke Sound, and the practice continued in our navy of equipping all ordinary steam cutters for torpedo service until within the last ten years. This, however, was only done in the absence of a more desirable boat, for the noise of the machinery and the lack of speed very soon marked the cutters as unsuitable for this class of work.

The torpedoes used during our Civil War were the offspring of emergency. Haste in manufacture and scant knowledge of the science of torpedo construction resulted in producing very imperfect weapons, which sometimes failed totally to accomplish what was expected of them. The chance of such failure was increased by a lack of experience in operating torpedoes and the inadequate appliances at hand for that purpose. These torpedoes, when not defective, were, however, most destructive when skillfully handled, and one writer, Mr. J. F. Scharf, attributes the loss of thirty-one vessels to torpedoes exploded by the Confederates.

The deepest interest was awakened among the maritime nations of Europe in this deadly method of attack, and they began at once the development of the torpedo and all that was necessary to render it a reliable and certain weapon. With better torpedoes and wider experience in controlling and guiding them came consideration of the character of boat best adapted for their use. Such a boat must avoid observation as far as possible and therefore should not be conspicuous. It must offer a poor target to an enemy's guns and therefore should be small. It must escape pursuit and therefore should be fast. Keeping in view these general requirements, Thornycroft built for the Norwegian government, in 1873, the first vessel ever constructed solely for torpedo service. This vessel, which is still in existence, is 57 feet long, has a displacement of $7\frac{1}{2}$ tons, and has made a speed of 14.97 knots. Her present remarkably good condition argues well for the lifetime of this class of vessels. Though she proved highly satisfactory, and met fully all that could be hoped for from the first boat representing a new departure in naval construction, she was regarded for four years as an experiment, and during that time no countries followed where Norway had led. In 1877, though, Russia commenced in earnest to build torpedo boats, ordering as many as 100 during that year, and England built one, the "Lightning," which proving satisfactory, she ordered twelve others. One of these twelve attained a speed of 22 knots. She, however, practically stopped at this point, and for seven years continually decried torpedo boats and stubbornly refused to treat them as worthy of her consideration. In 1884 she only had 19 as against Russia's 115 and France's 50, and it was not until she was driven to it by this activity upon the part

of her neighbors that she entered upon the building programme that gives her to-day more torpedo boats than any other nation.

In naval warfare the powers of destruction and protection have held each other a close race. Whenever the penetration of the projectile has been increased, the armor plate has been thickened or hardened or both. The torpedo is the only weapon that stands unchallenged by the art of defence, and for this reason it is hard to overestimate its value.

Nothing so deadly has ever been introduced into warfare. It offers but two alternatives—avoidance or destruction. In it powers are concentrated that do not admit of defence. The torpedo net, a steel netting arranged to be hung around a ship from spars, is probably more effective than any other defence that has been tried ; but these nets are very difficult to handle, impede the speed of the ship, and have been rendered vulnerable by a device attached to the torpedo, and known as a “net cutter.”

As with artillery directed against unprotected men, which must be silenced before it becomes ineffective, so it is with the torpedo boat, which must be put out of action before it is in-operative. There is no protection against a torpedo if it strikes its mark and explodes. The most powerful battleship ever built may become its victim as readily as the lightest tug. When the torpedo boats of France became a menace to England, she quickly saw that she could not rely on nets, or any of the devices for defence that had been proposed. There was but one means of protection and that was to hunt down and destroy the torpedo boats of the enemy. This means that she at once directed all her energies to securing a vessel that could be relied upon to run down torpedo boats. She built a number of vessels designed to do this and these have become known as torpedo boat catchers. They all, however, proved utter failures, for as in nature so in naval architecture there are some inexorable laws. One of these is that within certain limits speed is not appreciably affected by size, and to secure greater speed the size of the vessel must either rise above or fall below these limits. To rise above makes the vessel so large as to be suitable only for a heavy battery, and to fall below brings it within the dimensions of a large sized torpedo boat. Though this law was well known as a matter of theory, it took England six years to learn that she could not disregard it in practice, and during that time she

stayed within the prohibited limits, producing the most ignominious failures, and the more marked her failures the more persistent were her efforts to attain speed without constructing a vessel either large enough or small enough to accomplish that purpose. None of the catchers ever proved capable of catching a torpedo boat. The fastest one only made twenty knots under the most favorable circumstances, two knots less than the speed made by one of the first twelve torpedo boats England built. In addition to lacking speed, the catchers were too large to be handled as quickly or easily as the torpedo boats. They were structurally weak and their seaworthiness was often questioned.

It now looked as though England would never solve the problem of protection against torpedo boats. All the valuable time and the immense amount of money she had expended on the catchers had been wasted. Her failures had attracted the attention of the world and it was apparent she would only render herself ridiculous by pursuing further the theory of construction on which these boats had been built. So in 1893, much chagrined and discouraged by her failures, she commenced the construction of a vessel upon an entirely different plan. This time she fell below the prescribed limits which had stood in the way of former success, and produced a vessel which was a large-sized torpedo boat capable of carrying a light battery. This craft was a marked success and exceeded in both speed and seaworthiness the most sanguine expectations. It was the first of the class of vessels now known as torpedo boat destroyers, which have entirely superseded the catchers and have been adopted by the foremost maritime nations. Vessels of this character can be built of great strength and with a seaworthiness that admits of their going anywhere, in any weather, and they have attained a speed of 30 knots and even more.

If no wars await us in the near future, and torpedo boat building is continued as a permanent feature of our navy, we will have gained rather than lost by our delay, for we can take advantage of the experience acquired abroad and avoid the difficulties that have been met and overcome there. Greater delay, though, would be dangerous, for there is always the possibility of war, and at present nothing would justify assuming that we are to have

perpetual peace. Furthermore, there is now nothing to gain and everything to lose by delay, for the torpedo boat has passed the experimental stage and radical changes in its development are no longer probable.

With the thirteen torpedo boats recently ordered in this country, every precaution has been taken to secure the latest improvements, the contractors not being confined in any instance to the Department's plans, but being allowed to bid also on plans of their own. In fact, the proposals of the Department have been general in their nature so as to induce shipbuilders to include in their own plans every modern improvement that competition could suggest. In this way the government has been able to avail itself not only of the knowledge of its own constructors, but also of that of the shipbuilders. This it has not hesitated to do, as is shown by the awards; for in all but the case of one of these boats contracts have been awarded on contractors' plans.

For the ten of the thirteen boats contracted for in October last, the awards were for three different classes of boats, four being for 20-knot, three $22\frac{1}{2}$ -knot and three for 30-knot boats. This classification resulted from adjusting the available appropriation to the greatest number of suitable boats procurable, careful consideration, of course, being given to what was needed in view of the almost total lack of torpedo boats of any description and the character of work that would most likely be required of them.

It was very clear from the plans submitted that the shipbuilders had examined carefully the latest boats abroad. The Union Iron Works was awarded the contract for a vessel of the torpedo-boat destroyer type. This vessel, which has been named the "Farragut," when completed, will be similar to the "Desperate," the latest torpedo-boat destroyer built by England, and it is safe to say that the departures by the Union Iron Works from the plans of the "Desperate" are in favor of a more formidable and effective boat. The Bath Iron Works, the successful bidders for the other two 30-knot boats, consulted in the preparation of their plans Professor Byles, of the University of Glasgow, the designer of the swift ocean steamers "Paris" and "New York." This company was so confident of what it could accomplish that it exceeded the requirements of

the law and guaranteed a speed of $30\frac{1}{2}$ knots. The three boats for which contracts have just been awarded in August are all required to make 30 knots.

There is every reason to believe that all these torpedo boats will fulfill expectations. From the days of the old sailing vessels, we have built the best war ships of their respective types in the world, and as our shipbuilders have spared no pains to acquaint themselves with this new type of vessel, it is not probable they will fall below their former record in any particular. We are the superiors of almost all countries in the quality of the engines we build, and the engines are a great consideration in attaining such high speed.

There have been no great wars since the introduction of the torpedo boat, but the performances of this new craft in the wars that have taken place leaves no doubt as to its merits. In the Russo-Turkish war, a Turkish ironclad was sunk in an encounter with a torpedo boat. In the Chilian revolution two torpedo boats attacked and sank in the harbor of Caldera an ironclad ship, the "*Blanco Encalada*." The strength of the Brazilian revolution lay almost entirely in the "*Aquidaban*," a second-class battleship, which came in and out of the harbor of Rio at will without regard to the guns from the forts. In fact, these guns were so powerless against her that it seemed at one time that she might render the rebellion successful, although the army ashore was on the side of the government. On the 16th of April, 1893, the torpedo boat "*Gustavo Sampaio*" attacked and destroyed the "*Aquidaban*," and this practically ended the war. The torpedo boat was struck during this attack three times in the hull and thirty-five times in the upper works, but sustained no serious damage, and the only person hurt aboard was a cadet, who lost his finger. During the Chinese-Japanese war, Japan enjoyed a great advantage through its torpedo boats. At Wei-Hai-Wei the Japanese with eight torpedo boats attacked the Chinese fleet, so disabling the iron-clad "*Ting Yuen*" that she had to be beached and abandoned. This was not accomplished, however, without the loss of two torpedo boats. The Japanese made a second attack with five boats and destroyed the Chinese schoolship and a tender without losing any of their vessels.

Because of their destructive character nothing is more de-

moralizing to an enemy than torpedoes, and the moral effect of being equipped for this kind of warfare is not to be despised, especially where the object of a navy is, as it should be, to keep peace. Fear of torpedoes was all that prevented the French from entering the Prussian harbors during the Franco-Prussian war, and the Japanese from going up the river at Yalu. There was, perhaps, no cooler act of courage during our late war than at Mobile, where Farragut, only a moment after the "Tecumseh" had struck a torpedo and gone down before his eyes, shot forward with his flagship directly over the course where he knew the torpedoes had been planted for the destruction of his fleet, signalling, as he went, to the warning from the "Brooklyn" of "Torpedoes ahead," "Damn the torpedoes." Captain Mahan in his life of Farragut, writing of this passage of the "Hartford" over these torpedoes, says "the cases of the torpedoes were heard by many on board knocking against the copper of the bottom, and many of the primers snapped audibly, but no torpedo exploded." Farragut's prompt action restored confidence to the wavering line, but had any one of the torpedoes exploded all would have been over.

Since then, such obstacles as Farragut braved have become only temporary, for devices have been introduced for cutting the exploding cable and hauling up torpedoes, which in a few hours could remove such defenses as protected Mobile harbor. This is but another reason why we need torpedo boats, which are now the only reliable appliances for carrying on torpedo warfare. Another and a more potent reason is that even vessels of this class cannot be built in a day, and when built should not be placed in the hands of raw and inexperienced crews. These boats can carry only a small number of men, the accommodations being necessarily cramped. The service is much harder than ordinary sea service, the periods of rest shorter and more irregular, and the nervous strain almost inconceivable. The mere vibration from a torpedo boat driven through the water at thirty knots an hour is known to have produced sea-sickness among some of the oldest tars. This character of warfare is now conducted on the most scientific principles, and a confidence born of familiarity with handling these crafts and a knowledge of precisely what they can do counts for more than physical courage. This familiarity must come from practice and experience.

Considering the quality and number of other war vessels we now have, the character and extent of our coast and the unprotected condition of our harbors, the efficiency of our navy can be increased more quickly by building torpedo boats than in any other way. The building of other classes of vessels should not stop in order that torpedo boat building should go on, but we cannot afford to neglect any longer this important element of naval strength. Taking recent bids as a basis of estimate, some twenty-five 30-knot torpedo boats or twenty or more torpedo boat destroyers can be built, including their armor and armament, for the cost of a single battle-ship complete.

BENJ. MICOV.